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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,789	11/24/2003	Kazunori Hagimoto	136034	1591
25944 7590 12/19/2008 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER				
WEISS, HOWARD				
ART UNIT		PAPER NUMBER		
2814				
MAIL DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/718,789

Applicant(s)

HAGIMOTO ET AL.

Examiner

Howard Weiss

Art Unit

2814

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 33, 35-38, 91 and 93-95 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 33, 35-38, 91, and 93-95 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/06)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Attorney's Docket Number: SUG-176-USAP

Filing Date: 11/24/03

Continuing Data: RCE established 11/15/2006 and 1/28/2008

Claimed Foreign Priority Date: 11/28/2002, 12/25/2002, 1/31/2003, 8/29/2003

Applicant(s): Hagimoto et al. (Noto)

Examiner: Howard Weiss

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 33, 35 to 38, 91, and 93 to 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasutimi et al. (JP 2001-339100), Carter-Coman et al. (U.S. Patent No. 6,222,207), Guo et al. (U.S. Patent No. 6,079,354) and Murasato et al. (U.S. Patent No. 5,744,829).

Yasutimi et al. show most aspects of the instant invention (e.g. Figure 2) including:

- A compound semiconductor layer **4** including a light-emitting layer consisting of N-type AlGaInP cladding layer **41**, an AlGaInP active layer **42** and a P-type AlGaInP cladding layer **43** and a light extraction surface **44** and sensitive to the wavelength ranges listed
- A silicon device substrate **2** bonded to said compound semiconductor layer
- A multilayered metal reflective layer **3** including an Au-based main metal layer **31** and an Ag-based **32** (i.e. Paragraph [0018] of user supplied translation) layer interposed between the Au-based layer and the compound semiconductor layer

Yasutimi et al. do not show a (Ag,Au)/Sb or (Ag,Au)/Sn substrate side metal contact layer and a silicon-diffusion-blocking layer having only Ti as a major component and

the layers in the light-emitting layer to be explicitly composed of $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$ where $0 \leq x \leq 1$ and $0 \leq y \leq 1$.

Carter-Coman et al. teach (e.g. Figures 2) that a metal reflective layer **34** can be either Au- or Ag-based (Column 5 Lines 25 to 30) therefore establishing their equivalence, a contact layer **32** and a silicon-diffusion-blocking layer **36** made of a conductive material with Ti as a major component (e.g. TiW) and a substrate side (Au,Ag)Sn layer **38** to produce an light emitting device with high reflectivity after subjected to high temperatures (Column 2 Lines 23 to 34). It would have been obvious to a person of ordinary skill in the art at the time of invention to make a silicon-diffusion-blocking layer made of a conductive material with Ti as a major component and a substrate side (Ag,Au)Sn layer as taught by Carter-Coman et al. in the device of Yasutimi et al. to produce an light emitting device with high reflectivity after subjected to high temperatures.

Guo et al. teach (Column 11 Lines 52 to 61) that Ti and TiW are equivalent materials known in the art to prevent silicon diffusion and to improve film adhesion. Therefore, because these conductive materials were art-recognized equivalents at the time of the invention was made and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, one of ordinary skill in the art would have found it obvious to substitute Ti for TiW since the substitution would yield predictable results. See Supreme Court decision in *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, 82 YSPQ2d 1385 (2007).

Murasato et al. teach (e.g. Figure 1 and Column 3 Lines 55 to 63 and Column) to use double hetero-structure $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$ where $0 \leq x \leq 1$ and $0 \leq y \leq 1$ in cladding layers **5,7** and active layer **6** to provide a high brightness, low operating voltage and high reliability device (Column 2 Lines 65 to 67). It would have been obvious to a person of ordinary skill in the art at the time of invention to use double hetero-structure $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$ where $0 \leq x \leq 1$ and $0 \leq y \leq 1$ in cladding layers and active layer

as taught by Murasato et al. in the device of Yasutimi et al. to provide a high brightness, low operating voltage and high reliability device.

Response to Arguments

3. Applicant's arguments with respect to Claims 33, 35 to 38, 91, and 93 to 95 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

5. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at **866-217-9197** (toll-free).

6. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(571) 273-8300**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 7:00 AM to 3:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via Howard.Weiss@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on **(571) 272-1705**.
8. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/ 96, 98, E33.068	thru 12/16/2008
Other Documentation: none	
Electronic Database(s): EAST	thru 12/16/2008

HW/hw
18 December 2008

/Howard Weiss/
Primary Examiner
Art Unit 2814